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# A carp hatchery: Its essential components, site, proper hatchery operation procedures

Aquaculture Department, Southeast Asian Fisheries Development Center

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# a carp hatchery

*Its essential components, site, proper hatchery operation procedures*

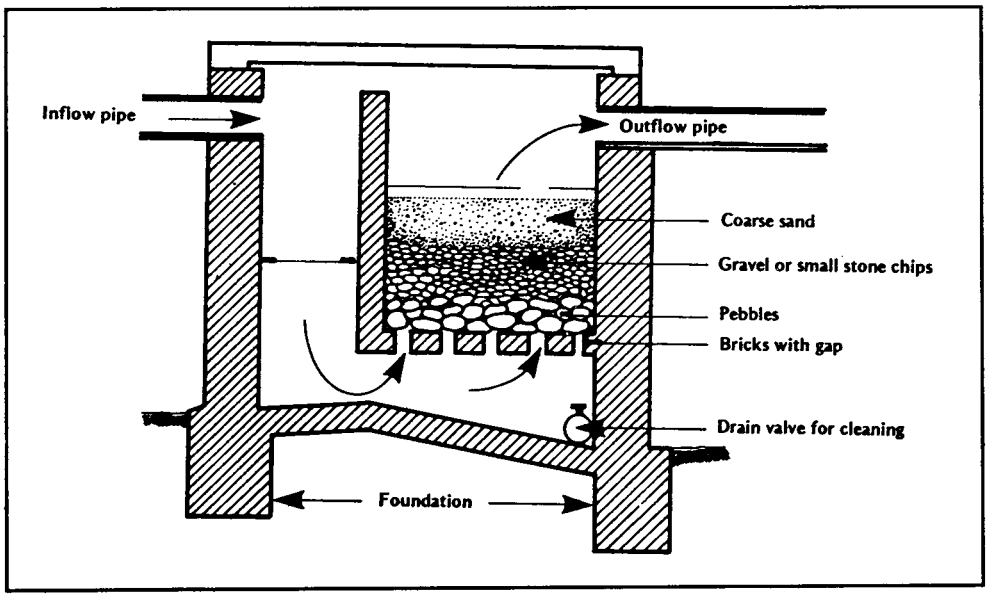
## The Site

The following can be an ideal site for a carp hatchery:

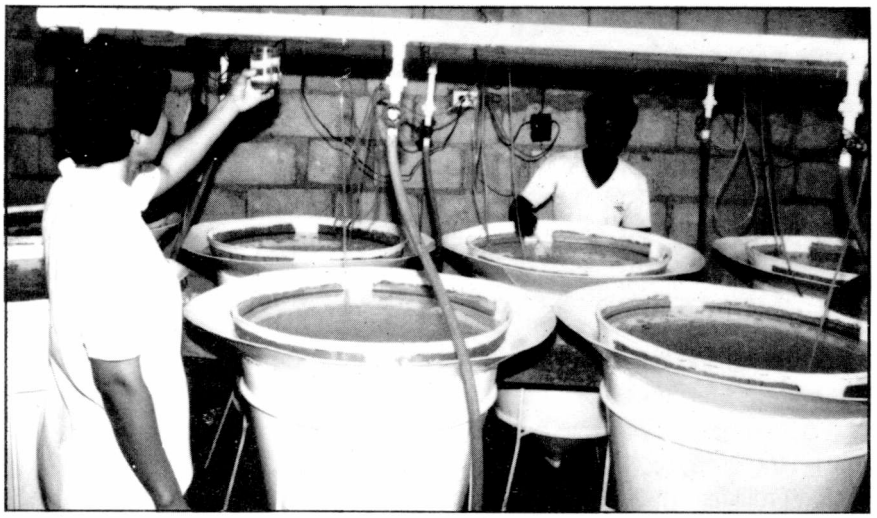
- ponds excavated at the site should provide a water retentive soil base, exposed by digging or transfer of top soil of the site to pond bottom and embankments;
- the pond bottom soil should posses basic mineral nutrients and respond readily to organic and inorganic fertlization;
- there should be an adequate source of water to supply the proposed hatchery;
- self-draining ponds can be conducted on sloping sites;
- the physical and chemical properties of the water are within the acceptable limits, such that water quality can be further manipulated by chemical treatment to suit aquacultural needs;
- the site is easily accessible by any means of transportation;
- there is a market in the vicinity;
- fertilizers and raw material for feeds required for aquaculture operations and building material for constructing the hatchery are available near the site;
- there is no industrial, domestic or pesticide pollution at the site;
- there are reasonable educational and medical facilities available in the vicinity of the site;
- there may be scope for integration of aquaculture with agriculture, horticulture or floriculture at the site.

## Essential components of a hatchery

- broodstock ponds to hold adult fish for spawning or serving as donors of pituitary glands and to accommodate spent females and males;
- a hatchery proper comprising a recuperating complex of facilities for fish spawning, hatching and care of hatchlings up to postlarval stage;
- nursery ponds for rearing postlarvae to fry stage;
- rearing ponds for growing fry to fingerlings;
- ponds for mature and maturing adults.




*A reverse flow filter*



*These recirculating hatching tanks are suited for medium-to-large-scale bighead carp hatchery*

**Proper hatchery procedures**

- Before releasing any broodstock, the ante-tank should be filled with pond water and an antiseptic substance.
- To prevent broodstock from jumping out, the ante-tank should be covered with netting having weights (like seine-net-sinkers).
- Only filtered, clear, cool, clean and oxygenated water at 27°C should be used in circular tanks.
- Its water level and outflow should be controllable by operating turn-down pipes.
- The rate of flow of water in the circular tank should be 30-45 liters per minute.
- There should be a net cover with sinker-like weights for the breeding tank which should be used to cover the tank after the broodstock have been injected and released in it.
- To safeguard against unexpectedly early breeding after injection (or occasionally even without injection) screens should be put in position.
- After spawning has taken place, a circular air diffuser should be installed at the base outside the screen and air from compressor or blower bubbled to keep the screen free from eggs.
- Spawners must be removed from the circular tank after eggs have been completely spawned. They must be given prophylactic treatment in ante-tanks before releasing in a broodstock pond or spent fish pond for possible subsequent maturity.
- After hatching has occurred, the rate of flow of water through the circular tanks should be increased to 45-50 liters per minute and a 5-8 mm meshed nylon net stretched across the tank in a slanting position to collect the discarded egg shells. The nylon net should be retrieved every few minutes to collect cast-off egg shells.
- If the clogging caused by egg shell bits is not remedied, the central screen fitted into the drain should be carefully replaced by a new one.
- The hatchlings may be left in the circular tank for four days if a second shift of egg nursing is not to be undertaken. If a second shift is to be undertaken within this period, then the hatchlings should be seined off and removed to the ante-tank.
- It is essential to periodically brush and hose-wash the screen and keep it completely clean after it has been used once in a breeding tank for few continuous days.

***Source: Jhingran, VG and RSV Pullin. 1985.A hatchery manual for the Common, Chinese and Indian major carps.***

**Note:** *A study conducted at SEAFDEC showed that the water hardness concentration significantly affects hatching rate of silver carp eggs. A water hardness of 300-500 mg/l CaCO3 is recommended for the successful hatching of silver carp. The paper entitled "The Effects of Water Hardness on the Hatching and Viability of Silver Carp (Hypothalmichthys molitrix) Eggs" from this study, won A. Gonzal and his co-authors E.V. Aralar and J. F. Pavico the Naga Best Paper Award in 1989.* Ed.